Digital Pinhole Photography

Written By: Forrest M Mims III

TOOLS:

- Pin (1)
- Scissors (1)
- Tape (1)

PARTS:

- Aluminum Foil or Soda Can (1)
- Digital Camera with Removable Lens (1)
- Hammer (1)
- Pliers (1)
- 1/4" drill bit (1)

SUMMARY

Long before the digital photography era, I enjoyed making photographs with a 35mm film camera equipped with a pinhole instead of a lens. The editors of Popular Photography magazine liked the results and published my article “The Pinhole: A ‘Lens’ that Just Won’t Quit.”

Much has happened since that article was published back in April 1974. A renaissance of sorts has occurred in pinhole photography, and Justin Quinnell is among its leaders. His website pinholephotography.org is loaded with hints, tips, and unique pinhole images. (See makezine.com/go/quinnell for an inspirational video about Justin’s work).

Suitable Cameras

Any camera with a removable lens has potential for pinhole photography. Conventional film cameras can be used, but digital cameras with removable lenses are ideal. The exposure time can be easily changed, and results are available instantly. A new entry-level digital SLR

costs $500 or more, but you might find a used one for considerably less.

Step 1 — How to Make a Foil Pinhole.

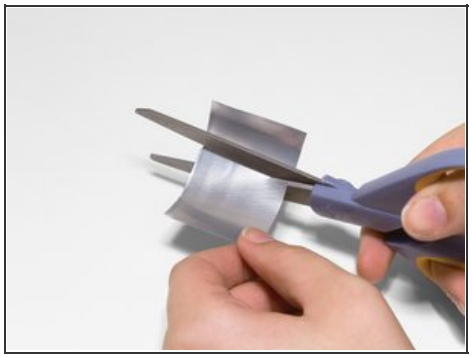


- The pinhole images I published in Popular Photography and my recent eclipse images were all made by pushing an ordinary 0.6mm-diameter pin entirely or partially through aluminum foil.
- Use scissors to cut a square of aluminum foil large enough to cover the lens opening of your camera. Heavy-duty foil is best, but standard foil is OK.
- Place the foil on a desk protector, place mat, or other flat substrate that has a slightly resilient surface. Smooth the foil by rubbing it with the tip of your finger.
- Carefully press the pin into but not completely through the foil. For initial experiments, the diameter of the hole should be about half the diameter of the pin.

Step 2

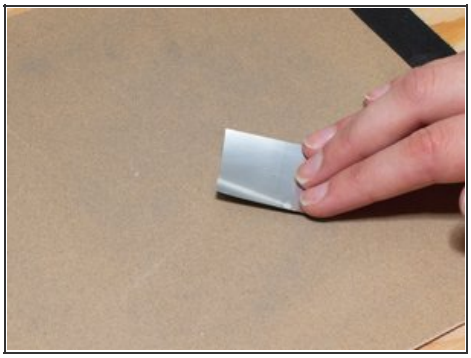
- Remove the lens from your camera and place the foil over the lens opening with the pinhole roughly centered. The topside of the foil should face away from the camera. Use masking tape to secure the foil in place. Be sure no stray light can enter the camera; it will wash out your images.

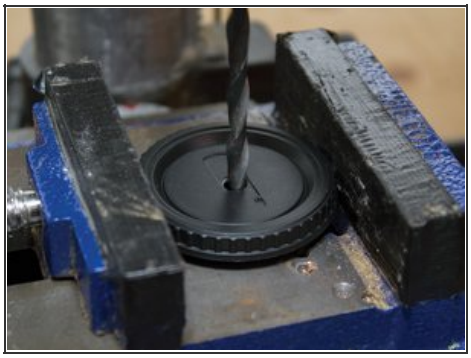
Step 3 — How to Make a Better Pinhole.


- For optically cleaner images, a pinhole formed in thin sheet metal is best.
- This method is easiest to implement by mounting the metal onto a camera body cap that is placed over the lens opening when the lens is removed. Aluminum or copper sheet metal from a hobby store will work, but the simplest and cheapest source is an aluminum beverage can, pie tin, or food tray.
- Rinse out an empty beverage can with water. Carefully cut the top and bottom off, cut lengthwise, and flatten to create one metal sheet.
- Use old scissors to cut several 1" squares from the flattened can.
- Place a metal square on a flat wood surface. Put the point of a straight pin at the center of the square and hold it in place with pliers.
- Lightly strike the head of the pin with a small hammer so that the pin just pierces the metal to form a circular hole about half the diameter of the pin.
- Make pinholes in several metal squares so you can experiment with them.

Step 4



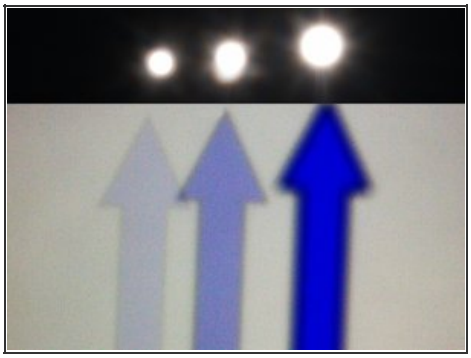


- Place a sheet of 220-grit sandpaper on a flat surface, business side up. Rub the backside of the metal square against the sandpaper to remove the crown burr, using circular strokes.
- Look through the pinhole to check its uniformity. About two-thirds of my pinholes made in this fashion appear perfectly circular, which is what you want.
- A magnifier such as a 10x loupe is very helpful.
- Bore a 1/4" hole in the center of the camera's body cap.

Step 5

- Place a metal square with a pinhole over or behind the body cap so the pinhole is centered in the 1/4" aperture.
- Secure it tightly with removable masking tape so you can try other pinholes later. When you find the best one, secure it with adhesive.

Step 6 — Characteristics of Pinhole Images



- Pinhole images are fuzzier than those made through a lens, but that can be an asset. If the fuzz is excessive, you can sharpen your images by using a smaller pinhole or photo processing software. **Image 1** shows the sharpening that resulted from reducing the pinhole size from 0.6mm to 0.3mm.
  - The three images of the sun and an arrow on a computer screen, photographed through 3 pinholes mounted on a Canon 40D digital camera. The largest pinhole (the width of a 0.6mm-wide pin) produced the brightest but fuzziest images (at right). The smallest pinhole (0.3mm) produced the dimmest but sharpest images.
- Another characteristic of pinhole cameras is nearly infinite depth of field. Make a pinhole photo of a very close object with a distant building or mountain in the background — it's all in focus. You can even use the sun for the distant object, but it will be fuzzy unless the exposure is brief.
  - **Image 2** was taken by a handheld beverage-can pinhole image of barbed wire illuminated by flash and the morning sun (1/60 sec., ISO 320). **Note:** all images except Image 3 were enhanced using Microsoft Digital Image Pro software.
- Pinholes punched through foil or thin metal leave behind a projection of torn metal on the exit side known as a crown burr (see makezine.com/go/astakhov). Pinhole photographers often remove the burr with sandpaper.
- When left in place, the burr can cause uniquely beautiful effects, especially when making pinhole photos of the sun, as shown in **Image 3**.
  - *Sun Spray*, a handheld image enhanced only by the crown burr formed in the aluminum foil pinhole (1/8 sec., ISO 100).

Step 7 — Pinhole Tips and Samples

- The best advice for the new pinhole photographer is one word: experiment. Try various pinhole sizes, mounting methods, and distances from your camera's sensor. Be careful to keep dust off your camera's sensor when removing the lens to install your pinhole.
- As for subjects, the world is your limit. Unlike a camera with a lens, it's easy to include the sun in pinhole photos. Just remember never to look directly at the sun through a pinhole camera.
- The images show three dramatically different views of a high-voltage power transmission tower, all made without a tripod.

Experiment!

Explore the tutorials at pinholephotography.org and other pinhole photography websites. After you learn the basics, mount your pinhole camera on a rigid tripod and try making portraits of perfectly still friends and relatives. Make a time exposure of the movement of the stars across the night sky. Or mount a pinhole on a light-tight extension tube to make a telephoto pinhole. Once you start making pinhole images, you'll soon think of many other ideas.

This project first appeared in Make Magazine Volume 33, page 104.

This document was last generated on 2013-01-31 11:44:17 AM.